



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/877,961	06/08/2001	Anthony J. Ruggiero	IL-9928	2189

7590

10/08/2003

Eddie E. Scott
Assistant Laboratory Counsel
Lawrence Livermore National Laboratory
P.O. Box 808, L-703
Livermore, CA 94551

EXAMINER

OLSEN, KAJ K

ART UNIT	PAPER NUMBER
----------	--------------

1753

DATE MAILED: 10/08/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/877,961

Applicant(s)

RUGGIERO, ANTHONY J.

Examiner

Kaj Olsen

Art Unit

1753

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-35 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 27-29 is/are allowed.
- 6) ☒ Claim(s) 1-12, 15-24 and 30 is/are rejected.
- 7) ☒ Claim(s) 13, 14, 25, 26, 31-35 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Claim Objections

1. Claims 33-35 are objected to because of the following informalities: On line 3 of the claim 33, “exist” should be --exit--. Appropriate correction is required.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
3. Claims 2, 16, and 18-24 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
4. In claims 2 and 20, specifying that the interferometer orthogonally intersects the separation channel is confusing. The interferometer is a plurality of components and it is unclear how the interferometer *as a whole* can be construed as intersecting the sample channel in an orthogonal manner. The examiner recommends the applicant instead specify that a interferometer has an arm that orthogonally intersects the sample channel.
5. In claim 16, it is unclear if the narrow line diode laser is the same thing as the “at least one light source” of claim 1, or if the applicant is specifying the presence of an additional light source in the form of a laser diode.
6. In claim 18, it is entirely unclear how to interpret the limitation calling for an unspecified component of a white light interferometry system. Because the applicant has not explicitly identified what this component is, what would one possessing ordinary skill in the art reasonably



Art Unit: 1753

construe as being that unspecified component? For example, if the microelectronic sensor were placed on an optics table, would that optics table be construed as being a component of the white light interferometry system?

7. Claim 19 is rejected because "the white light interferometry system" lacks antecedent basis. It would appear that claim 19 should have depended from claim 18 and the examiner will interpret it as such for the purpose of applying prior art.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 1-12, 15-20, 24, and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bornhop (USP 6,381,025 B1) in view of Faubel et al (Opt. Eng. 35(12) pp. 3555-3561).

10. Bornhop discloses a sensor system that comprises a separation channel 22, at least one interferometer (col. 4, line 66 through col. 5, line 16), at least one excitation beam (col. 8, lines 64-66), at least one light source 12 and at least one photo receiver 25 (col. 5, lines 35-52).

Bornhop does not explicitly disclose making the excitation beam to be modulated. Faubel discloses in an alternate interferometer that making the excitation beam modulated allows one to lock-in to the detected signal, which improves signal analysis (fig. 1 and p. 3557). It would have been obvious to one of ordinary skill in the art at the time the invention was being made to utilize the teaching of Faubel for the sensor system of Bornhop in order to improve signal analysis.

Art Unit: 1753

11. With respect to the different uses of the separation channels, that is only the intended use of the apparatus and the intended use need not be given further due consideration in determining patentability. However, see Bornhop abstract and Faubel introduction.

12. With respect to the rate of chopping, that is only the intended use of the apparatus and the intended use need not be given further due consideration in determining patentability.

13. Faubel also teaches the use of argon ion lasers for the excitation beam (p. 3557, col. 1, first full paragraph).

14. With respect to the appropriate optical path distance or choice of laser frequency, it would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the set forth path distance and laser frequency, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

15. With respect to claims 17, 19, and 24, these claims merely recite an intended use of the apparatus and the intended use need not be given further due consideration in determining patentability.

16. With respect to claim 18, any number of the set forth structure of Bornhop or Faubel could conceivably be a component of the unclaimed white light interferometry system (see 112 rejection above).

17. With respect to method claim 30 (those limitations not covered above), Bornhop is drawn to the measuring of refractive indexes (col. 2, lines 37-51).

18. Claims 21-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bornhop and Faubel as applied to claim 20 above, and further in view of Burns et al (USP 6,379,929 B1).

Art Unit: 1753

19. The references set forth all the limitations of the claims, but did not explicitly set forth the presence of a plurality of sample processing equipment. Burns discloses in an alternate microfluidic device that sample processing equipment such as micro pumps, micro valves, and/or reagent cartridges are conventional in the art (col. 10, lines 39-49; col. 39, lines 1-15; col. 79, lines 10-20). Said processing equipment facilitates the handling of fluids through the lab on a chip device and it would have been obvious to one of ordinary skill in the art at the time the invention was being made to utilize the teaching of Burns for the sensor of Bornhop and Faubel in order to automate the fluid handling for the sensor.

Allowable Subject Matter

20. Claims 27-29 are allowed.

21. Claims 33-35 would be allowed if the objection to claim 33 were corrected.

22. Claims 13, 14, 25, 26, 31, and 32 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

23. The following is a statement of reasons for the indication of allowable subject matter:

With respect to claims 13 and 14, the prior art does not disclose nor render obvious all the limitations of claim 12 and further comprising the combination of interferometer with two phase modulators and a polarization maintaining fiber. With respect to claims 25-29 and 33-35, the prior art does not disclose nor render obvious the combination of all the elements of the claims (and the claims they depend from where applicable) with particular attention to two interferometer arms or beams intersecting the separation channel in the claimed manner. With

Art Unit: 1753

respect to claims 31 and 32, the prior art does not disclose all the limitations of claim 30 and further comprising the set forth combination of first, second and exit ports where a change in the index of refraction is measured at a reference position.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kaj Olsen whose telephone number is (703) 305-0506. The examiner can normally be reached on Monday through Thursday from 7:00 AM-4:30 PM. The examiner can also be reached on alternate Fridays.

If attempts to reach the examiner are unsuccessful, the examiner's supervisor, Mr. Nam Nguyen, can be reached at (703) 308-3322.

When filing a fax in Group 1700, please indicate in the header "Official" for papers that are to be entered into the file, and "Unofficial" for draft documents and other communications with the PTO that are not for entry into the file of this application. This will expedite processing of your papers. The fax number for regular communications is (703) 305-3599 and the fax number for after-final communications is (703) 305-5408.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist, whose telephone number is (703) 308-0661.



Kaj K. Olsen
Patent Examiner
AU 1753
September 30, 2003